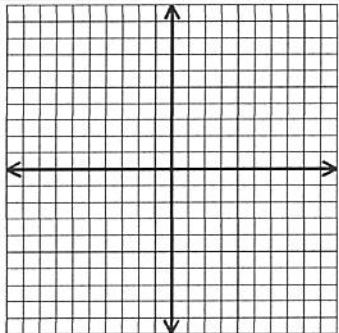
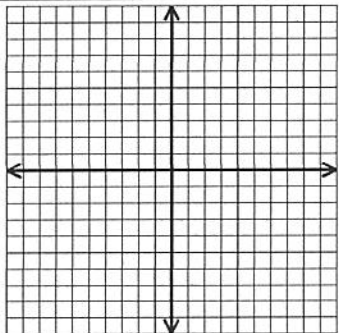


## More Parent Functions

Function	Key Characteristics	Domain and Range	Graph
<b>Hyperbola</b>  Equation: _____	x-intercept:  y-intercept:  Vertical Asymptote:  Horizontal Asymptote:		
<b>“Volcano”</b>  Equation: _____	x-intercept:  y-intercept:  Vertical Asymptote:  Horizontal Asymptote:		

## Remember These?

### Transformation Rules

- $f(x) + a$  is  $f(x)$  shifted upward  $a$  units
- $f(x) - a$  is  $f(x)$  shifted downward  $a$  units
- $f(x + a)$  is  $f(x)$  shifted left  $a$  units
- $f(x - a)$  is  $f(x)$  shifted right  $a$  units
- $-f(x)$  is  $f(x)$  flipped upside down ("reflected about the  $x$ -axis")
- $f(-x)$  is the mirror of  $f(x)$  ("reflected about the  $y$ -axis")

Name: \_\_\_\_\_

Date: \_\_\_\_\_

PC: Hyperbolas and Volcanoes

Sketch each function using a minimum of 2 points and including any and all asymptotes.  
For each graph, state the domain, range, intercepts and equations of any asymptotes.

1.  $y = \frac{1}{x+2}$

9.  $y = \frac{2}{x}$

2.  $y = \frac{1}{x} + 1$

10.  $y = \frac{1}{2x^2}$

3.  $y = \frac{1}{x-1} - 3$

4.  $y = -\frac{1}{x-4} + 2$

5.  $y = \frac{1}{(x+5)^2}$

6.  $y = \frac{1}{x^2} - 6$

7.  $y = \frac{1}{(x-3)^2} + 1$

8.  $y = \frac{1}{-(x+2)^2} - 4$